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ABSTRACT

This document consists of the two 1998 issues of a journal reporting new research in early child development conducted by the Frank Porter Graham Child Development Center at the University of North Carolina at Chapel Hill. In the Spring 1998 issue, articles highlight the Center's diverse cross-cultural projects and global research, training and technical assistance projects. This issue also reports on: the founding of the Step by Step childhood education program; a U.S./Russian collaborative project called "Special Education and Social Work Services for Children with Disabilities and Their Families"; collaborative research with European and Asian countries; the international collaborative Latino Families of Children with Mental Retardation project; the Partnerships for Inclusion program, which provides technical assistance to Hispanic communities in North Carolina; and a survey of public and private kindergarten teachers on children's transition into kindergarten. The Fall 1998 issue reports study findings on: the link between sleep behaviors and learning development in preterm infants; assessing health risks earlier; the role of poor nutrition in virus mutations; and strategies for dealing with ear infections in early childhood. Other articles report news of respiratory infections in child care settings and controlling diarrhea in out-of-home infant care. (JPB)

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Field Notes

This issue of *Early Developments* highlights the diverse cross-cultural projects and global research, training and technical assistance projects of the Frank Porter Graham Child Development Center (FPG) at the University of North Carolina at Chapel Hill. Our major challenge was tracking down some researchers, who were hard at work overseas.

For example, Mark Wolery, an FPG investigator and director of Early Childhood Research for our Family and Child Care Program, returned just at deadline from a conference in Kazakhstan. He said he received a warm and enthusiastic reception, adding, "That's an amazing society." He also said the meeting was held not far from where the Soviets had tested a large number of aboveground and atmospheric nuclear devices. "So there were a lot of negative health effects as a result of that." Other FPG researchers in countries that had been part of the Union of Soviet Socialist Republics also report eager receptions of their work.

In other news, leading child development researchers from around the nation last fall attended the first synthesis conference of the National Center for Early Development & Learning (NCEDL), administratively based at FPG. This was a working conference with the topic "Research into Practice in Infant Toddler Care." Authors of ten papers, with subjects ranging from cognitive development to respiratory disease, presented summaries and answered questions during the Chapel Hill meeting. Conference organizers Thelma Harms and Debby Cryer divided those attending into groups that synthesized each paper's implications for practice, policy, personnel preparation, and research. Papers and synthesis work will be published in a book by Brookes Publishing. A book for practitioners is also planned. The second NCEDL synthesis conference was scheduled this winter in Charlottesville, VA, with the topic "Research on the Transition to Kindergarten."

—Loyd Little
editor

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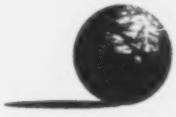

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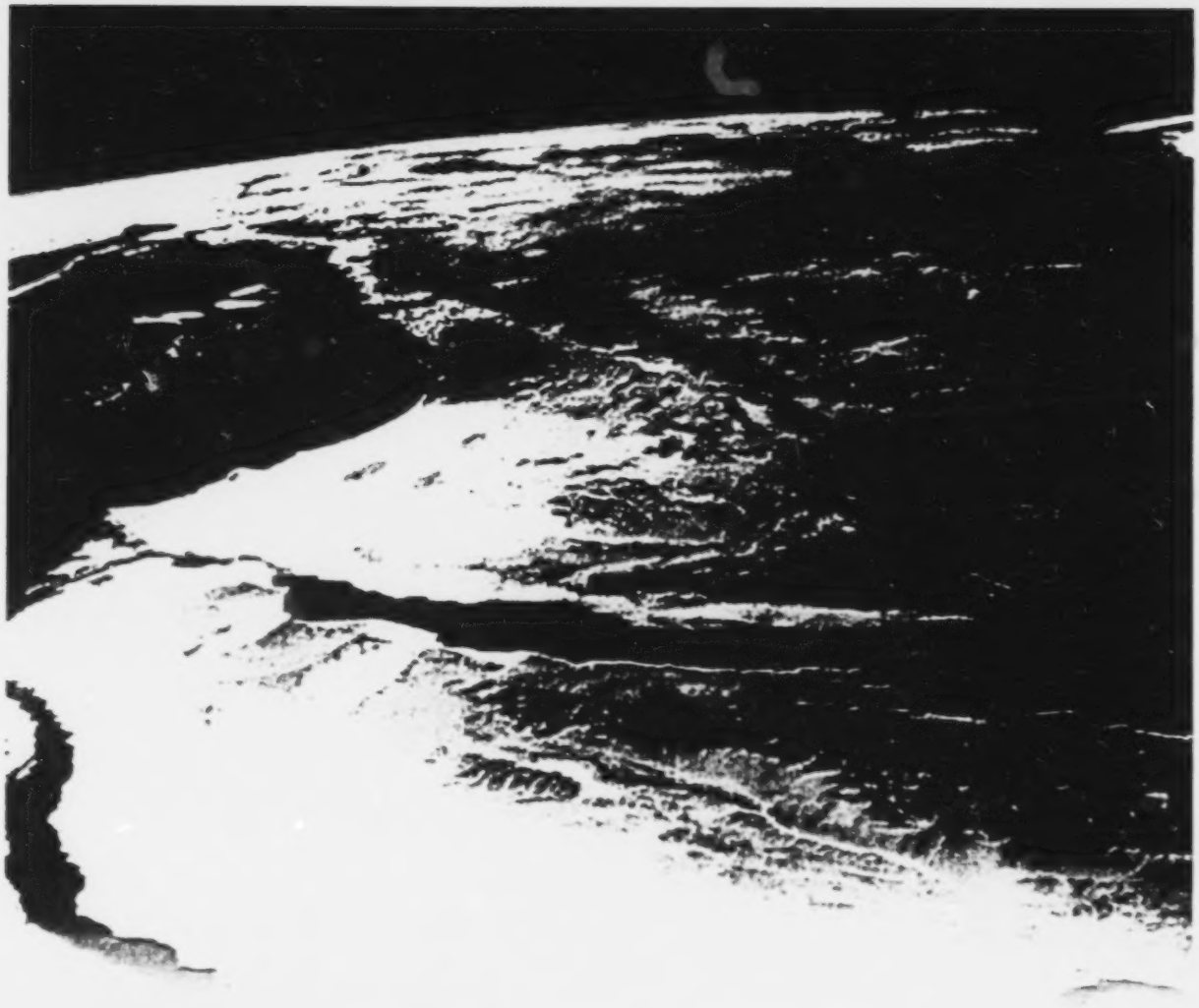

From the director's office

Our world view

IN RECENT YEARS I HAVE HAD THE HONOR AND PLEASURE of visiting such diverse countries as Sweden, Portugal, Russia, and India. These visits, and the ensuing discussions with parents, practitioners, and faculty, have helped me to see issues related to child development, child care, and early intervention from a different perspective. Culture and history are indeed powerful influences, shaping child-rearing practices, expectations for children, and views about the role and importance of agencies and programs in the lives of children and families.

You don't have to go to India, however, to experience diversity. Our own country is made up of individuals from different parts of the world with wide variations in languages, customs, and beliefs. How our systems of child care and early intervention address this diversity is a critically important topic for research and for practice.

In this issue of *Early Developments*, we highlight some of our efforts to study children and families from diverse cultures and to provide information and materials in different languages. Although we have done a lot, it seems to me that we are still just beginning. Ultimately we must develop models of service that are accessible and acceptable to persons from diverse cultures. We must also begin during the earliest years to identify and use strategies that will maximize the likelihood that children will recognize and respect the diversity that will always be characteristic of our society.

—Don Bailey

Bailey is director of the Frank Porter Graham Child Development Center and holds academic appointments in both the School of Education and the School of Medicine at UNC-Chapel Hill.

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TAKING Technical assistance ON THE ROAD

INVESTIGATORS FROM the Frank Porter Graham Child Development Center (FPG) at the University of North Carolina at Chapel Hill are involved in projects from Singapore to Russia as part of the center's increasing role in global training and technical assistance.

FPG began technical assistance programs in the early 1970s and, by 1984, the center had worked with more than 530 local programs throughout all 50 states, the District of Columbia, and six US territories. In the late 1970s, the center began the first of many projects involving technical assistance in Latino communities and, later, in Native American communities.

By the early 1990s, FPG's researchers were at work in the Peoples Republic of China, Eastern Europe, and the former Soviet Union. For example, in 1995 Shelley deFosset and Pat Trohanis began working with the privately financed Step By Step program which was aimed at creating early childhood education demonstration projects initially in17 emerging democracies of Central and Eastern Europe and the former Soviet Union.

Step by Step founder and sponsor, George Soros, through his Open Society Foundation, wanted to create a childhood education project that would ultimately lead to a new participatory citizenry beginning with the youngest members of society, its children. Educators and parents in the countries involved have been enthusiastic—and, by the end of the second year, Step by Step was in 1,500 classrooms serving over 37,500 children and families. Most countries have been successful in getting local funding for the programs.

Though a subcontract with Children's Resources International of Washington, DC, which is the Open Society's technical assistance arm for the Step by Step project, deFosset and Trohanis have hosted two groups of Russian teachers and administrators in the United States, and deFosset estimated that she's visited Russia "16 or 17" times. While in the US, Russians received training and visited numerous preschool programs. "When we're in Russia, we do training in the cities—the project has grown to 12 cities in Russia—and then we visit programs and provide feedback on existing programs," said deFosset.

The reception of both those visiting the US and of the US team visiting Russia has been "absolutely spectacular," said deFosset. "There has been an incredible celebration

Step by Step

Some aspects of the Step By Step program

- active choice by children,
- participatory learning through play and discovery,
- negotiation of learning opportunities with other children,
- teaching assistants in the classroom,
- teachers as facilitators,
- lowering of the adult-child ratios by using assistant teachers, many of whom are parents,
- parent activity rooms at each school, and
- parent advisory committees participating in the decision-making process.

of the project as well as the sharing of ideas. Families love the program. They are very excited. One reason is that it fits with the Russian philosophy of supporting children and families very closely."

Originally, the program was set up for teaching children three to seven years old. Now, it has been expanded upward to include the third grade. "It's moving up in grades, across the cities and across the countries," deFosset said. The program is also expanding around the world. It now includes South Africa, Georgia, and Haiti.

Soros is a self-made billionaire, who is a native of Hungary and now a naturalized American citizen. In the fall of 1997, he pledged to give an additional $500 million to Russia aimed at heath, social, and civic programs. e

WHERE THEY WENT...

A glimpse at some of the work being done by FPG researchers around the globe—

A RECENT US/RUSSIAN COLLABORATIVE project is "Special Education and Social Work Services for Children with Disabilities and Their Families," funded by the International Research and Exchange Board. FPG's Rune Simeonsson and Irene Zipper visited Saratov, Russia, on two occasions and helped arrange for Russian faculty to visit the US with the goal of learning about various perspectives on the education of and intervention with children with disabilities.

In another project, Simeonsson and three other FPG researchers took part in a university training project in Portugal funded by the European Union from 1995 to 1997. The program was aimed at helping Oporto University establish a graduate program in early intervention and family support. Each FPG researcher taught the equivalent of a semester's course in one week of intensive training. They also worked with university faculty to adjust and institutionalize the course into their training program. In addition to Simeonsson,

Don Bailey, Pam Winton and Mark Wolery from FPG participated in the training.

FPG researcher Thelma Harms spent part of last fall in Singapore where she was a keynote speaker and presented workshops for the Association for Child Care Educators. (Her visit, by the way, came during the extra heavy haze and smog caused by extensive forest fires in Indonesia. She reports that the haze was so thick it closed Indonesian and Malaysian airports and sent many Singaporeans to hospitals with respiratory problems.)

Harms keynoted at the Quality '97 Conference in Gothenburg, Sweden, last fall. While there, she lectured at Gothenburg University and consulted with the research team that uses the Swedish version of the *Early Childhood Environment Rating Scale* (ECERS) in research on early childhood education in Sweden. Harms is one of the authors of ECERS.

In the fall of 1997, FPG investigator Mark Wolery presented a paper on "Social and Public Policy for the Care of Children with Mental Retardation" before the Kazak American Scientific Practical Conference in Kazakhstan. Wolery also visited programs for children in the city of Semipalatinsk, giving feedback and consultation.

On the Indian subcontinent, FPG continues to expand its international collaborations by sharing in a five-year grant funded by the US Indian Fund for Cultural, Educational, and Scientific Cooperation and involving three coordinating agencies: the National Institute for the Mentally Handicapped (NIMH) in Secunderabad, India; the US Department of Health and Human Services, Administration for Children and Families; and FPG. The purpose of the project is to develop and evaluate a community-based program of supports for families of persons with mental retardation living in a large urban area of India.

FPG investigators act as consultants and collaborators on the project, assisting with instrument development, program design, and evaluation. Each year either faculty from

...WHAT THEY DID

UNC-CH visit India or faculty from India come here. Collaborators from FPG are Bailey, Debra Skinner, and Rune Simeonsson. Collaborators from India include Dr. Reeta Peshawaria and Dr. D.K. Menon. Dr. Peshawaria is a clinical psychologist at NIMH and is principal investigator on the grant. Dr. Menon is director of the NIMH.

Don Bailey went to India in 1996 at the request of the NIMH and the US Embassy to help prepare the proposal, and in March of 1997, Drs. Menon and Peshawaria visited FPG to continue planning. Bailey and Skinner visited India in January, 1998.

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Thinking globally

Collaborative research with other countries means far more than speaking the same languages. In order to get credible results across cultures, we must be certain our assessment tools are measuring the same thing from nation to nation.

In other words...

ARE WE COMPARING APPLES AND MANZANAS?

FPG RESEARCHERS HAVE JOINED the European Child Care and Education Study (ECCE) in the International Child Care and Education Study (ICCE), the first phase of which examined this very question.

The overall study is longitudinal and is analyzing the relationship between quality child care and child outcomes. However, the first phase was to see if two widely used scales in the US — the *Early Childhood Environment Rating Scale* (ECERS) and the *Caregiver Interaction Scale* (CIS)—could be used with accuracy in other countries. These process elements were examined: safe care, healthful care, developmentally appropriate stimulation, positive interactions with adults, individual emotional growth, and promotion of positive relationships with other children.

Conducted in Austria, Germany, Portugal, Spain, and the US, the study found that the psychometric characteristics of the two instruments were generally acceptable across the countries involved.

In addition, the researchers identified differences between the countries in process quality and were able to explain the details of these differences. For example, in examining the mean ECERS scores, it was found that Austrian and German child care settings scored highest. These two counties are generally assumed to have stronger infrastructures for the support of high quality early childhood education services. Also, they have a tradition in which physical space is arranged for children's free choice and exploration rather than emphasizing group activities. Personal care and play-oriented activities in small groups as well as individual play are emphasized.

On the other hand, in Spain, the country that scored lowest on the ECERS, a more traditional school-oriented approach is used with an emphasis on teacher-directed classroom work that includes the whole group, while free play and individualized work of children are less emphasized. It should be noted that differences in ECERS scores were smaller than expected, considering the variation in the early childhood systems.

Various countries may emphasize different aspects of process quality as they create their early care and education programs. These different emphases help explain the relatively similar ECERS means that were found. For example, the US tended to score higher on ECERS space and materials items than did other countries, but lower on items related to personalized care. Portugal, however, appears to emphasize personalized care but had lower space and materials scores. Across countries, the overall pattern for how the two instruments related to one another was relatively similar. These results indicated that the instruments had very similar properties when used in different countries. Internal consistencies were generally high.

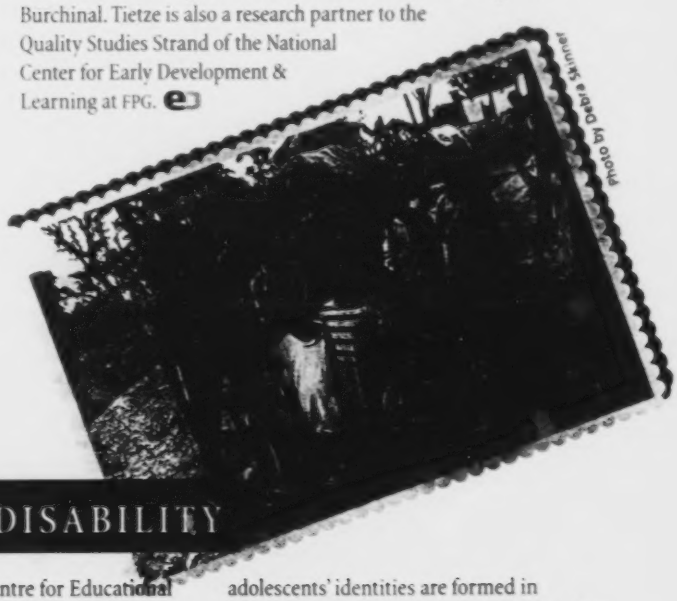
In regard to the CIS scales, significant national differences were found only for the Sensitivity subscale, with Austria and Spain scoring higher than the US. However, even these differences were small. In all countries observed, CIS scores indicate that adults generally displayed high levels of sensitivity, acceptance, and involvement in their interactions with children.

This initial phase of the larger study concluded that future analyses are needed to identify to what extent country-specific regulations and traditions determine process quality and how process quality is linked, if at all, to the development of the children served. These are issues being explored as part of the larger ICCE study.

Debby Cryer, an investigator with FPG and one of the researchers involved in the study, said that during the next phase investigators are following the children into grade school. "What we are looking for is the relationship between the quality of early childhood education that the children received and the developmental outcomes," she said.

The ICCE study is coordinated by Dr. Wolfgang Tietze of the Freie Universitat Berlin, Germany. The research reported for the United States is part of the larger Cost, Quality and Child Outcomes in Child Care Centers Study, conducted by teams at the Frank Porter Graham Center, the University of Colorado at Denver, the University of California at Los Angeles, and Yale University.

The ECERS scale was authored by Thelma Harms and Dick Clifford, two FPG investigators. In fact, Harms and Clifford worked with researchers from the European countries to adapt the ECERS for the ICCE study. In addition to Cryer and Clifford, other FPG investigators involved in the study are Ellen Peisner-Feinberg and Margaret Burchinal. Tietze is also a research partner to the Quality Studies Strand of the National Center for Early Development & Learning at FPG.



CULTURAL CONCEPTIONS OF DISABILITY

CONCEPTS OF DISABILITY are culturally as well as biologically constructed. The study, Perceptions of Health, Disease, and Disability in Nepal: Implications for Early Intervention, explored those concepts in urban and rural Nepal from the perspectives of anthropology, public health, child development, and special education in order to identify and define the need for early intervention services.

Collaborating with FPG researchers Debra Skinner and Virginia Buysse in the 1996 study were Cecilia Zapata of the School of Public Health at UNC at Chapel Hill and Renu Thapa of the Centre for Educational Research Innovation and Development, Tribhuvan University, Nepal.

The project, funded by an FPG Small Grant, sprung from earlier anthropological studies by Skinner in Nepal. In fact, Skinner met her Nepali collaborator, Renu Thapa, eight years ago when Skinner was a Fulbright scholar and Thapa's sister was working in the Fulbright Office in Kathmandu.

Among Skinner's earlier works in Nepal is an ethnographic study of child development, specifically addressing how children's and adolescents' identities are formed in changing sociopolitical worlds. She has been to Nepal six times.

Skinner said that the goals of this most recent research project, Perceptions of Health, Disease, and Disability, were to describe cultural conceptions of disability, treatment, and intervention needs, gather information on services available, assess early intervention programs, and initiate collaboration with Nepali researchers. She is submitting grant proposals to continue research and/or set up training and technical assistance programs.

PARENT, PROFESSIONAL & COMMUNITY PERSPECTIVES

Although many beliefs and practices are different from the US, Nepal offers the West some lessons, in the opinion of Skinner:

- ▲ Disability was often attributed to sins in a past life, but most parents rejected negative cultural meanings and became advocates for their children. Several grassroots organizations had been established by families of children with disabilities to provide training and therapies not otherwise available.
- ▲ Creative media programs appeared on radio and television to encourage children with disabilities to achieve certain goals, and to change attitudes among the general populace about persons with disabilities.
- ▲ Inclusion of children with disabilities in community life was the norm, although schools were just beginning to implement inclusion as a practice.
- ▲ Services were separated by disability type, but were becoming more responsive to family needs and priorities. Although most professionals operated with limited resources, many demonstrated devotion to serving children and their families.
- ▲ Both parents and professionals recognized that they were unaware of practices that could increase the quality of life for children with disabilities. They are beginning efforts to develop early intervention services for young children and their families.

Researchers interviewed parents of children with disabilities and observed services and programs for those children. They found that both parents and professionals face challenges:

- ▲ In the harsh environment of rural Nepal, a child born with moderate to severe disabilities had little chance of survival.
- ▲ Many professionals said they were chronically underfunded, lacked training opportunities, and needed to know more about developmental disabilities.

Toward a more diverse cultural community

One ongoing FPG cross-cultural project examines how Latino families adapt to a child with mental retardation. The study incorporates ethnographic considerations and perceptions of families. Another current study examines how sociocultural factors affect the language of African American children and how language skills affect their progress during the early school years.

Photo by Ed Wong

SINCE ITS FOUNDING in the late 1960s, the Frank Porter Graham Center has included many people from diverse cultural backgrounds in its research, training, and technical assistance projects. In fact, the first major project at FPG—the Abecedarian Project—focused on early intervention for African American children living in poverty. By the late 1970s, FPG had begun involving Latino communities, and later projects embraced Native American communities. The first translations of research materials into another language began in the late 1980s.

Today, one of the larger projects at FPG is Latino Families of Children with Mental Retardation. The principal investigator is Don Bailey, director of FPG. Debra Skinner, an anthropologist at FPG, is project director; and Vivian Correa with the University of Florida at Gainesville is co-principal investigator.

Families' beliefs and expectations

This project examines how families adapt to a child with mental retardation, focusing on three areas: beliefs about mental retardation, its causes, treatment options, and ultimate expectations for the child with mental retardation; perceived family needs that extend beyond direct intervention services for the child; and perceived usefulness of professional and agency services.

Researchers are studying 250 parents of Puerto Rican or Mexican heritage who have a child from birth to age 5 diagnosed with mental retardation or developmental delay. Twenty-five parents from each group are single mothers. Of these 250 parents, all of whom live on the US mainland, 20 will participate in more intensive ethnographic interviews to explore themes that emerge during the initial interviews.

"This should give us detailed narratives about parents' understandings and experiences of disability, supports, and services, and a meaningful context for interpretation of other data," Skinner said.

Culture is a critical component of this project because the definitions of appropriate treatment and success in treatment vary in part as a function of cultural factors, said Bailey. Also, the documented underuse of services by individuals from some ethnic groups means that professionals need to know why these families don't use or can't gain access to services.

The first wave of data is now being analyzed, and Skinner said, "We expect that our findings will challenge some of the previous literature on Latino families of young children. This project should help practitioners modify practices, expectations, and program policies in ways that will make early intervention and other family support services more accessible to families of diverse ethnic backgrounds." The project is funded by the National Institutes of Health and the National Institute of Child Health and Human Development.

> The definitions of appropriate treatment and success in treatment vary...as a function of cultural factors

Language skills and success in school

In another cross-cultural study at FPG, Joanne Roberts is examining how sociocultural factors affect the language of African American children and how language skills mediate children's success during the early school years. Funded by US Department of Health & Human Services' Maternal and Child Health Bureau and the Spencer Foundation, this study is midway through a five-year program.

Roberts said one theory for the consistently higher rates of school failure among African American children, as compared to their non-minority peers, is that the language experiences of many African American children do not match the classroom language. Another theory is that differences in school success rates are due to differing expectations and perceptions of school success by the child, family, and school setting.

This study builds on an earlier study, Otitis Media in Children and Later Language and Learning, which examined 88 African American children whose otitis media history, psychoeducational development, family environment, and child care experiences have been documented from infancy to age 4. Otitis media is one of the most common illnesses of early childhood and the most frequent diagnosis made by physicians in young children. Healthcare costs for the diagnosis and management of otitis media are estimated at $5 billion annually.

Hearing loss and language skills

Otitis media is of particular concern to the development of young children because fluid in the middle ear can impair the transmission of sound causing a mild to moderate conductive hearing loss. It has been hypothesized that a mild to moderate fluctuating hearing loss associated with frequent and persistent otitis media during the formative years of language learning may be responsible for later language and learning difficulties. Although many studies have supported this linkage, others have not and the nature of this relationship is controversial.

Also funded by the Maternal and Child Health Bureau, the study examined how a history of otitis media with effusion (OME) and associated hearing loss during early childhood related to the development of language and learning during the preschool years. Children attending nine community child care programs entered the study between 6 and 12 months of age. Ears were examined every other week and hearing sensitivity was tested when children were well and when ill with OME. Home and child care environments were assessed annually, and communication and cognitive skills were tested once a year.

Roberts and colleague Susan Zeisel found that OME is highly prevalent in infants attending child care and more prevalent than reported in previous studies. Data have indicated that the quality of the home and child care environments mediated the relationship between OME and associated hearing loss. Children with more frequent OME and associated hearing loss tended to have less responsive home and child care environments and this association was linked to lower performance on infant assessments.

Roberts' new study picks up 75 of these children and follows them as they enter kindergarten and elementary school.

> Persistant otitis media during the formative years of language learning may be responsible for later language and learning difficulties.

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Recent publications
by researchers at the Frank Porter Graham Child Development Center

Section 619 profile, 8th Ed.
S. deFosset, & M. Carlin. (Sept. 1997). Chapel Hill, NC: UNC, FPG, National Early Childhood Technical Assistance System.

Marital conflict and the development of infant-parent attachment relationships
M.T. Owen, & M.J. Cox. (1997). *Journal of Family Psychology, 11*, 152–164.

NICHD Early Child Care Research Network. The effects of infant child care on infant-mother attachment security. Results of the NICHD study of early childcare
M.J. Cox. (1997). (corporate author). *Child Development, 68*, 860–879.

NICHD Early Child Care Research Network. Child care in the first year of life
M.J. Cox. (1997). (corporate author). *Merrill-Palmer Quarterly, 43*, 340–360.

NICHD Early Child Care Research Network. Poverty and patterns of child care
M.J. Cox. (1997). (corporate author). In J. Brooks-Gunn & G. Duncan (Eds.), *Consequences of growing up poor*. New York: Russell-Sage.

NICHD Early Child Care Research Network. Family factors associated with infant child care characteristics
M.J. Cox. (1997). (corporate author). *Journal of Marriage and the Family, 59*, 389–408.

Early intervention and mediating processes in cognitive performance of children of low-income African American families
M.R. Burchinal, F.A. Campbell, D.B. Bryant, B.H. Wasik, & C.T. Ramey. (1997). *Child Development, 68*, 935–954.

Parents as child care consumers
D. Cryer, & M.R. Burchinal. (1997). *Early Childhood Research Quarterly, 12*, 35–58.

Enriching lives through language

Providing technical assistance and training across cultures means first and foremost speaking the language, and for several years FPG projects have been translating resources for Latino families.

Most recently, Partnerships for Inclusion (PFI), which provides a variety of technical assistance to communities in North Carolina, has developed *QuickNotes*, a resource kit in English and Spanish about early childhood inclusion for child care consultants.

"We realized there were a number of communities that we needed to be reaching with our products. We saw several North Carolina agencies begin to translate some of their brochures into Spanish. Also, Pat Wesley [PFI director] lives in a small town south of Chapel Hill and was very aware of the number of Latino families moving into that area, from just over 500 in 1990 to an estimated 7,000 now," said Sabrina Tyndall, who directs special projects for PFI.

QuickNotes is a 10-module set of bilingual information sheets, with each module organized by topic in a 3-ring notebook, contained in a portable crate. *QuickNotes* is designed to be easily copied by consultants who want to make information available to child care providers who often have questions about how best to meet the needs of the children they serve.

To translate *QuickNotes*, PFI hired Javier Sanchez, a doctoral student at the University of North Carolina, who is a native of Spain. In addition, Elia Sustaita, a native of Mexico, was recruited as editor and a Spanish-speaking review board was set up to review the Spanish version, just as the English version has an editor and a review board. *QuickNotes* was expected to have been ready by February, 1998, and would be for sale. For more information, contact

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Sabrina Tyndall at 919-966-7174 or email her at: sabrina_tyndall@unc.edu.

Also, PFI publishes a 20-page newsletter *All Together Now!* for more than 14,000 early child care professionals, primarily in North Carolina. *All Together Now!* is a unique publication because it is funded by nine state agencies to address the interests of both professionals and families in the early intervention and early childhood fields. Editor Molly Weston says major articles will be translated into Spanish. Because of these activities and the growing need to communicate with Spanish speakers, Sanchez will continue as a translator with PFI.

But making a difference across cultures means more than translating materials. In partnership with another FPG project, Child Care and Early Intervention: Linkages for Successful Inclusion of Young Children with Disabilities, PFI has offered training in both English and Spanish for several years. Working to improve early intervention and child care services, the Linkages project targets two North Carolina groups—the Latino community of Chatham County and the Haliwa-Saponi Indian Tribe of Halifax and Warren Counties. Project-related materials and meetings involving Chatham County's Latino population are presented in both Spanish and English. Linkages is co-directed by Virginia Buysse and Debra Skinner.

One of the biggest challenges in conducting bilingual meetings, according to Pat Wesley, is reminding English speakers to slow down and allow time for the interpreter to speak. "We now provide meeting participants and trainers with written suggestions for working with an interpreter."

A recent highlight of the PFI/Linkages collaboration was Nuevos Horizontes: Una Fiesta de la Comunidad in Siler City, NC, a community that has seen a large influx of Latinos in recent years. Information tables were staffed by a variety of human services groups in the area, and many of the speakers spoke Spanish. Interpreters were also on hand.

Many other FPG projects are re-examining their activities with a critical eye on cultural diversity. For example, the FPG website committee is scheduled to consider in early 1998 a Spanish version of the FPG home page on the Internet. e

QuickNotes

The modules at a glance

- Typical child development
- Developmental disabilities
- Setting up the early childhood environment
- What is early childhood inclusion
- Including children with special needs
- Health and safety
- Behavior management
- Families
- Early Intervention Lending Library Catalog

more...Recent publications

Developmental growth curves of preschool children with vision impairments

D.D. Hatton, D. B. Bailey, & M.R. Burchinal. (1997). *Child Development, 68,* 788–806.

Correlates of depressive symptoms in HIV-infected mothers with infants

M. Miles, M.R. Burchinal, D. Holditch-Davis, & Y. Wasilewski. (1997). *Journal of Family Psychology, 11,* 23–34.

Creating risk and promise. Children's and teachers' co-constructions in the cultural world of kindergarten

D. Skinner, D. Bryant, J. Coffman, & F. Campbell. (1998). *Elementary School Journal,* 98(4), 1–14.

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R. T. Gross, D. Spiker, & C. Haynes (Eds.). (1997). Palo Alto, CA: Stanford University Press.

Chapters—

C. T. Ramey, J. J. Sparling, D. Bryant, & B. H. Wasik. The intervention model (pp. 17–26).

B. H. Wasik, D. M. Bryant, C. Lyons, J. J. Sparling, & C. T. Ramey. Home visiting (pp. 27–41).

D. Bryant, C. T. Ramey, J. J. Sparling, & B. H. Wasik. The child development centers (pp. 42–58).

D. T. Scott, D. Spiker, H. C. Kraemer, C. R. Bauer, D. Bryant, N. A. Constantine, & J. E. Tyson. Possible confounding issues (pp. 156–180).

C. T. Ramey, D. Bryant, B. H. Wasik, J. J. Sparling, K. H. Fendt, & L. M. LaVange. Participation in the intervention and its effect on the cognitive outcome (pp. 190–202).

B. H. Wasik, D. M. Bryant, J. J. Sparling, & C. T. Ramey. Maternal problem solving (pp. 276–289).

D. M. Bryant, C. T. Ramey, J. J. Sparling, B. H. Wasik, & K. H. Fendt. The program development office: Structure and function (pp. 370–380).

J. Ferguson, B. Mulvihill, D. Spiker, & D. Bryant. Health and safety in the CDCs (pp. 448–459).

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Initial results from an eight-page survey sent to nearly 11,000 public and private kindergarten teachers

Examining the transition into kindergarten

KINDERGARTEN TEACHERS SAY a major barrier to their helping more with children's transitions into kindergarten is that class lists are generated too late, according to a new national survey by the National Center for Early Development & Learning (NCEDL).

If class lists were received earlier, teachers could more easily arrange meetings with parents and children before kindergarten begins, a recommended practice.

National Center for Early Development & Learning

The 3,824 kindergarten teachers who responded to the survey were asked to select barriers to implementing additional transition practices from a list of 16 possible barriers. The three most commonly selected barriers were "class lists are generated too late" (53%), "requires work in the summer that is not supported by salary" (45%), and "a transition plan is not available in the school/district" (41%).

Making the transition

Teachers also indicated that although they believe a majority (52%) of children experience a "very successful, virtually no problems" entry into kindergarten, a significant minority (16%) have "a difficult or very difficult entry, serious concerns, or many problems."

Putting the puzzle together

The survey was sent in late 1996, and the data began to be analyzed in the spring of 1997. The survey provided information on the relative frequency of transition practices (before and after kindergarten starts), their perceived effectiveness by teachers, strategies that teachers use, and barriers that teachers see to using effective practices.

Complete results of the survey will be published later this year and will be showcased in a symposium to be held this spring at meetings of the American Educational Research Association.

What's ahead

The survey is one of five projects in NCEDL's Kindergarten Transitions strand. The strand is examining how relationships within school, home, and community affect transition outcomes for children. Other strand projects are:

- A Kindergarten Transitions Synthesis Conference scheduled for February, 1998, in Charlottesville, VA
- A comprehensive observation of transition outcomes in kindergarten of a sample of more than 300 children studied prospectively since birth (a three-site cohort of the National Institute of Child Health and Human Development Study of Early Child Care)
- A study that will implement and evaluate an intervention designed to improve the quantity and quality of child-peer, child-teacher, teacher-parent, and parent-school relationships for young children at high risk of school failure
- A systematic re-analysis of existing data sets to address transition practices

Directors of the Kindergarten Transition strand are Martha Cox at the Frank Porter Graham Center and Robert Pianta at the University of Virginia. NCEDL is administratively housed at FPG.

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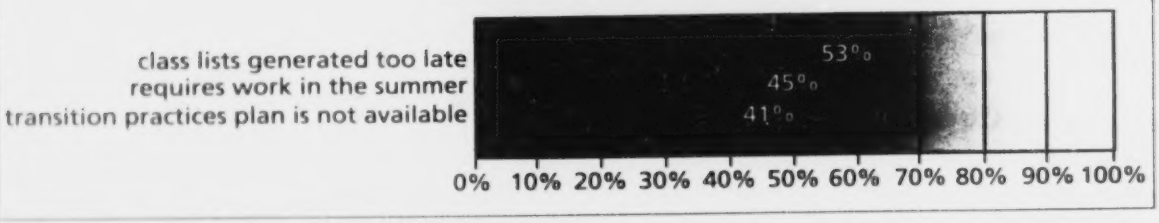
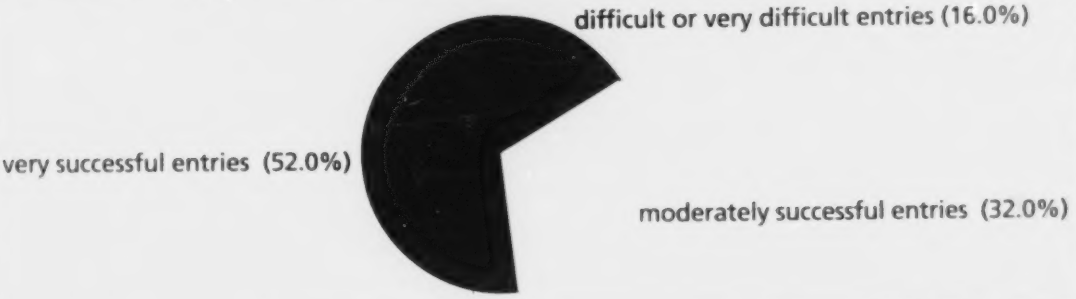
Survey results

What barriers do teachers see to doing more to help with the transition into kindergarten?

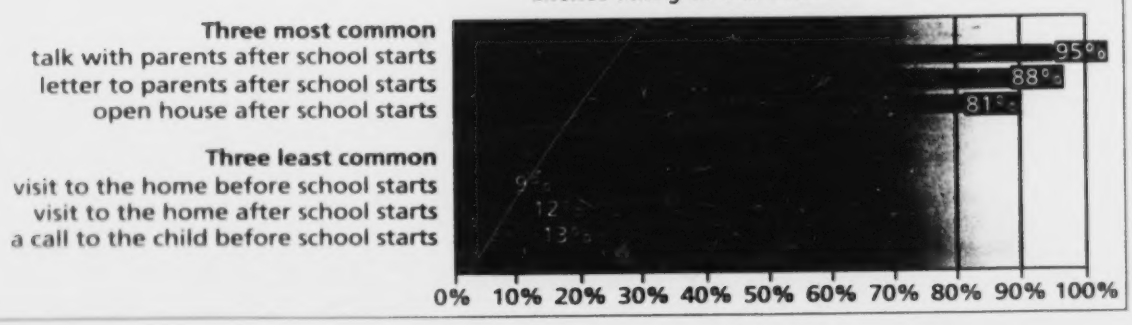

class lists generated too late
requires work in the summer
transition practices plan is not available
53%
45%
41%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Based on your experience, what percentage of children who enter kindergarten fall into the following categories?



How are teachers helping children make the transition to kindergarten?

Of the 23 practices that were listed to help children make the transition to kindergarten, the most common ones all occurred after school had already started. The least common practices involved visiting the child's home.


Three most common
talk with parents after school starts
letter to parents after school starts
open house after school starts
Three least common
visit to the home before school starts
visit to the home after school starts
a call to the child before school starts
95%
88%
81%
0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

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New collaborative links

Working together to promote culturally appropriate training resources

COLLABORATION IS A BYWORD at the National Center for Early Development & Learning (NCEDL), housed at FPG, and nowhere is that more visible than in a new collaborative link between NCEDL and a new research institute at the University of Illinois at Urbana-Champaign.

The five-year institute is the Culturally & Linguistically Appropriate Services Institute (CLAS) funded by the Office of Special Education Programs of the US Department of Education.

CLAS's objective of critiquing early childhood practices and resources through the lens of cultural and linguistic diversity caught the eye of Pam Winton who directs the Research To Practice strand at NCEDL. One proposed activity of the Research to Practice strand is developing a resource guide to early childhood training materials. This would be an enlargement of an activity begun in 1987, when Winton was a research investigator at FPG working with the Carolina Institute for Research on Infant Personnel Preparation.

On the shelf

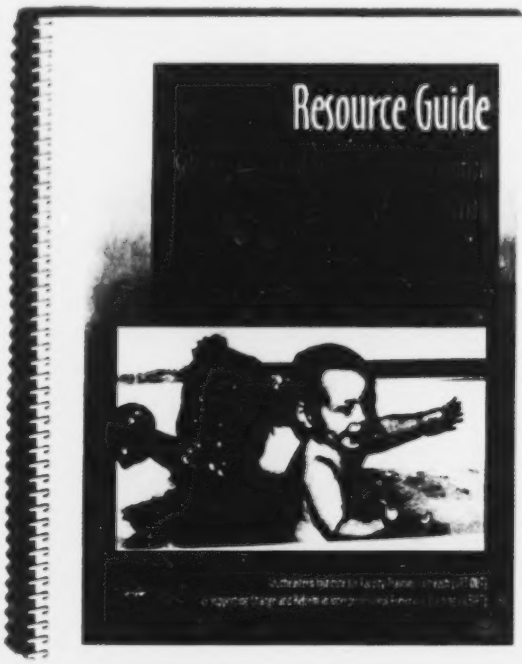
Winton said, "At that time, I noticed that many projects are funded for three or five years to develop useful products as part of their mission. But when the project ends, these products end up on the shelf because rarely is money or time left for dissemination. On the other hand there are many faculty, consultants, and administrators involved in staff development who desperately need these resources."

To help meet that need, she developed in the late 1980s a resource guide focused on family/professional collaboration in early intervention. This guide was later expanded by Winton and researcher Camille Catlett through the Southeastern Institute for Faculty Training (SIFT and later SIFT-OUT) and the Supporting Change and Reform in Interprofessional Preservice Training (SCRIPT) projects.

Expanded horizons

NCEDL is expanding the guide further by adding early childhood training resources. CLAS's goals include the creation of a resource bank of validated cultural and linguistically appropriate materials and documented strategies related to recommended practices in early childhood. Rather than duplicating effort, NCEDL and CLAS are collaborating around this aspect of their shared goals.

Winton's collaboration includes helping acquire early childhood resources and materials, identifying field reviewers and helping design their training, producing a literature review of early childhood training practices, and developing guidelines for



The 150-page Resource Guide: Selected Early Childhood/Early Intervention Training Materials *is now in its 6TH edition.*

Copies are available for $10 from FPG, CB# 8185, UNC-CH, NC 27599-8185. For questions about content, please call Camille Catlett at (919) 966-6635 or email her at <camille@unc.edu>. This publication can also be viewed and downloaded at the FPG website on the world wide web at <www.fpg.unc.edu>.

reviewers. Guidelines will focus on cultural and linguistic appropriateness as well as how materials reflect recommended practices.

She gives an example of how the process works. "Materials will be screened at an initial level, and entered into a database. Then materials on a topic, such as transition practices, would be assigned to two independent field reviewers with expertise in that topic. Using the review guidelines, the reviewers would not only consider whether material reflects current research and recommended practices related to transitions, but also whether the material is appropriate for all children and families. For instance, are transition timelines and strategies sensitive to the needs and work patterns of migrant or seasonal workers? Ultimately this rich descriptive information about existing products will be available to consumers."

Winton said, "We know that most product developers market their products as appropriate for all families and children; we think our process will demonstrate that this is not always the case. This will take the field to the next step of being more critical and aware at both the product development end and the consumer end.

"CLAS plans to develop materials that fill the gaps found through the review of existing materials. In addition, we hope these review criteria will be used by other national organizations, such as NCEDL, NAEYC, and the Regional Educational Laboratories, who develop products. Existing products from organizations, such as these, will also go through the review process."

Matching needs and products

She said CLAS is also acquiring grassroots products for specific needs. For instance, a community with a large influx of Hmong families may have developed materials in the Hmong language. Other communities may have a similar need but don't know where to look for existing products. An online database will help match needs and products. NCEDL will support printing and distributing the portion of the guide devoted to training resources.

CLAS will begin reviewing materials in the spring of 1998, and has asked that anyone interested in having their materials reviewed and entered into the CLAS database get more details by calling 703-620-3660 or emailing clas@cec.sped.org. CLAS principal investigators are Lillian Katz of ERIC-Early Childhood Education and Susan Fowler of the University of Illinois at Urbana-Champaign.

Add FPG web sites to your resource list

Here are web sites of projects and centers affiliated with the Frank Porter Graham Child Development Center at the University of North Carolina at Chapel Hill.

FPG

<www.fpg.unc.edu>
This is the home page for the Frank Porter Graham Child Development Center. It includes each issue of our magazine, Early Developments.

NCEDL

<www.fpg.unc.edu/ncedl>
This is the home page of the National Center for Early Development & Learning.

NEC*TAS

<www.nectas.unc.edu>
The National Early Childhood Technical Assistance System (NEC*TAS) works with the U.S. Department of Education to help states, territories, and communities implement programs and develop services for young children with disabilities and their families.

ECRI-SU

<www.unc.edu/depts/ecri>
The Early Childhood Research Institute on Service Utilization is wrapping up a five-year study of federally mandated and state-implemented early intervention programs for children with disabilities from birth to age 3.

ECRI

<www.inform.umd.edu/EDUC/WWW/Depts/ecri>
The Early Childhood Research Institute on Inclusion is a five-year project to study comprehensively the inclusion of preschool children with disabilities in settings with typically developing children.

MENTAL RETARDATION CENTER

<http://www.fpg.unc.edu/mrrc>
This is the home page for the N.C. Mental Retardation Research Center, a program to advance knowledge about the etiology and treatment of mental retardation.

SMART START

<http://instruct.unc.edu:6080/web/schools/5/3245/kbernier/fpg11971/>
This is a discussion forum, a virtual town hall, if you will, for Smart Start partnerships in North Carolina.

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Research spotlight

Recent findings at FPG

Parents as Child Care Consumers

Debby Cryer & Margaret Burchinal
Early Childhood Research Quarterly, 12, 35–58 (1997)

Part of the Cost, Quality, and Child Outcomes in Child Care Centers Study conducted in 1995 examined the views parents held about the child care center in which their child was enrolled. Nearly 3,000 parents participated by rating the importance of several dimensions of child care and rating the quality of their child's center. The quality ratings completed by parents were also rated by professional data collectors.

The results, published recently in Early Childhood Research Quarterly, found that parents felt that all aspects of care were very important. Especially high ratings were given for the quality of interactions with children, health, and safety. Of particular interest, however, is that parents rated the quality of their child's center significantly higher than did professional observers. The differences between parent and professional ratings were especially large when parents were asked to rate aspects of centers that were more difficult to monitor.

The findings show that parents and professionals do not necessarily agree on the quality of care being provided in a given center. Many possible reasons exist for this discrepancy. Parents may have different criteria for quality than do professionals. They may rate centers more globally whereas professionals may give different ratings to various dimensions of programs. Parents also may not have the opportunity to observe the full range of practices or may have difficulty acknowledging that they have placed their child in a center whose quality is inadequate.

One critical component to the improvement of child care is having informed parents who can evaluate and monitor quality in their child's program. Resources are needed to make it easier for parents to meet these expectations. Further research in this area should help parent educators, resource and referral agencies, and family support groups to provide further assistance to families during the process of deciding on care for their child.

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How health issues affect child development

University of North Carolina at Chapel Hill
Frank Porter Graham Child Development Center

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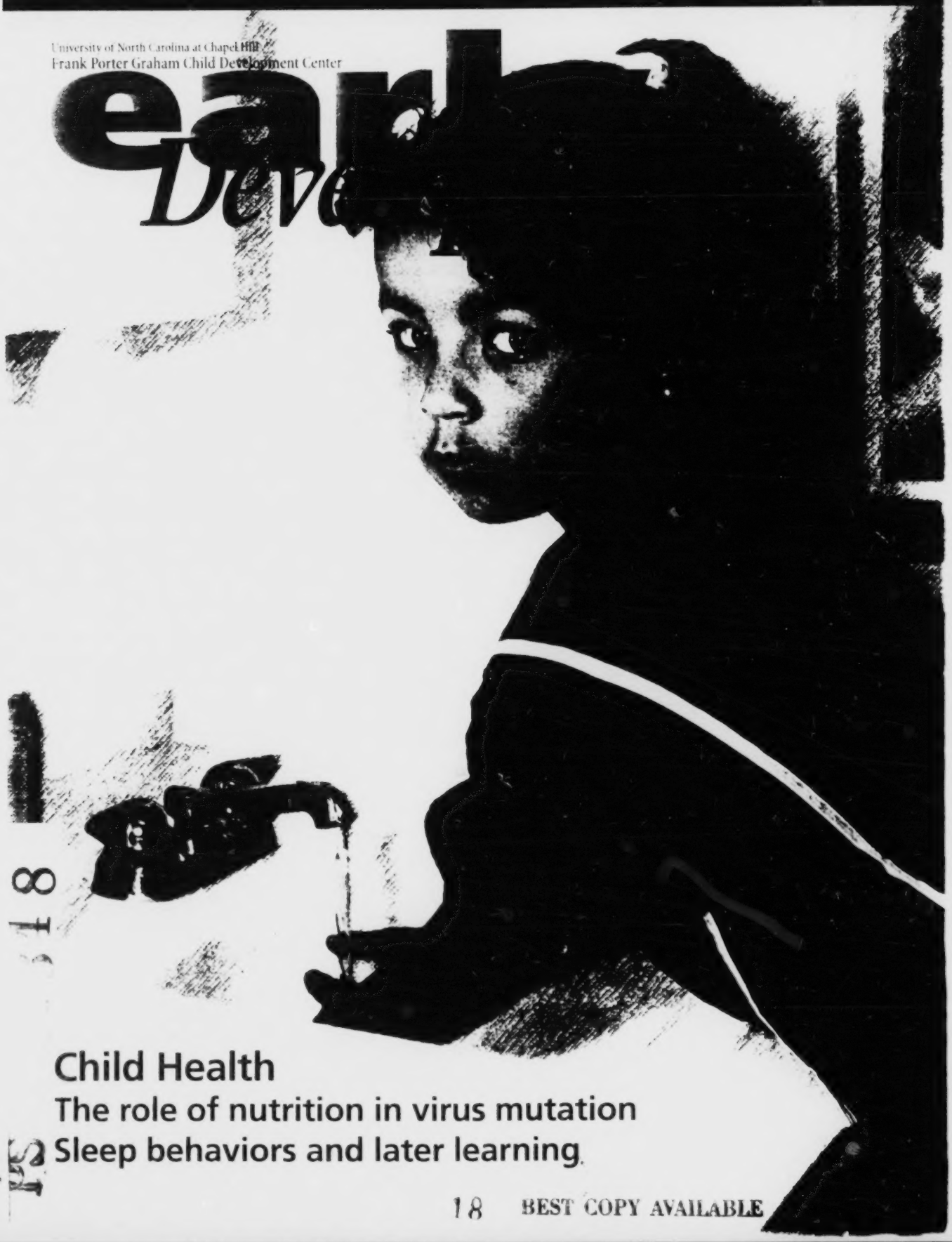

Child Health

The role of nutrition in virus mutation

Sleep behaviors and later learning

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Field notes

Could there be a link between groundbreaking research at the Frank Porter Graham Child Development Center and the "bird flu" that prompted Hong Kong officials to slaughter more than a million chickens last winter?

Melinda Beck, an FPG researcher, has established—in mice at least—that the common coxsackievirus, which gives us mild colds or perhaps a slight sore throat, can mutate into a nasty bit of business that can affect the heart muscle with fatal consequences. The mutation can come about when the host is deficient in either selenium or vitamin E. The unsettling part is that once mutated the virus can go on to attack people with no nutritional deficiencies.

This is fascinating new work that may help explain why new influenzas appear in the world every year or so. And the implications of her findings for healthy populations are profound. In this issue of *Early Developments*, our articles highlight Beck's work and other research at FPG involving children's health.

However, our researchers don't just do research, they help translate research into good practice. One example is Joanne Roberts, a senior FPG investigator who has studied otitis media—infection of the middle ear—and bridged the gap that often occurs between research and practice. She has worked with the U.S. Department of Health and Human Services to draw up recommendations for medical management and hearing testing for children with otitis media with effusion (OME), fluid in the middle ear.

In a new book, *Otitis Media in Young Children: Medical, Developmental, and Educational Considerations*, Roberts and her co-editors provide not only the latest research on otitis media, but also its effects on children's communication and learning. The book's editors apply research to clinical practice, and explain the best ways to identify, treat, and manage middle ear problems. In this issue of *Early Developments*, we look at Roberts' work and report on practical strategies for caregivers, teachers and families in dealing with a problem that affects about 30% of preschool children being evaluated for acute illnesses in the outpatient setting.

—Loyd Little
editor

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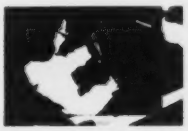
fax: 919-966-0862
email: <loyd_little @unc.edu>

PRETERM INFANTS—Sleep behaviors and learning development, page 4



NUTRITION STUDIES—Critical roles in emerging infectious diseases, page 8

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early *Developments*

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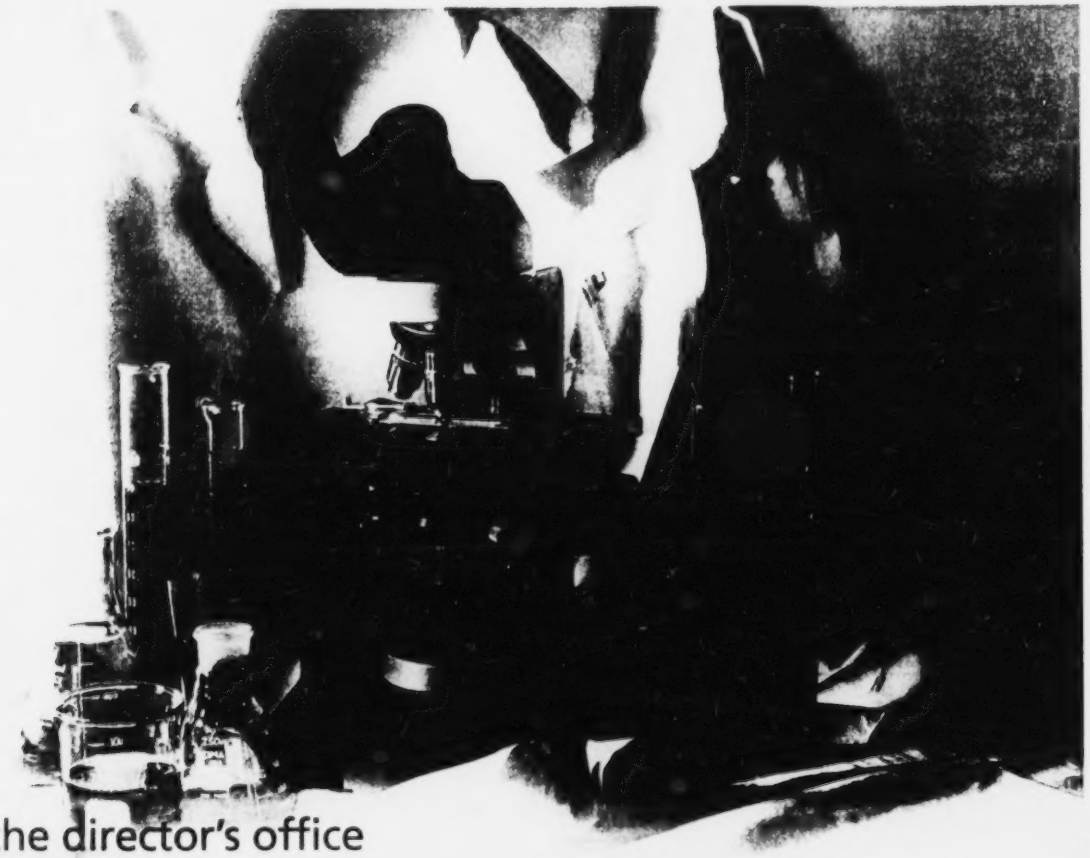


From the director's office

Health and well-being

WHEN YOU HEAR THE TERM CHILD DEVELOPMENT, most people think about language, cognitive, social, or motor development. During early childhood, however, and probably throughout the lifespan, health interacts with development in ways that we are just beginning to understand. Children's health is affected by the environments in which they live and play, as evidenced by the effects of poverty on children's access to nutritious diets or the data showing that ear infections are likely to be higher for infants in child care centers than infants at home. Likewise, child development is affected by children's health. Children who are malnourished, frequently ill, or who have a chronic health condition, are at risk for delayed or impaired development.

Fortunately, the important interrelationships between health and development were recognized when the Frank Porter Graham Child Development Center was established more than 30 years ago. Pediatricians were involved from the very beginning in planning the center and the health of children in child care centers has remained a focus of research ever since. In this issue of *Early Developments* we summarize some of our current major activities in the health arena.

We have learned that health is not just a medical issue, but rather is a topic that needs to be studied by a variety of disciplines, beyond medicine, including nursing, speech and language pathology, audiology, early childhood education, psychology, social work, nutrition, and virology. Some of this work requires an understanding of the basic molecular mechanisms by which nutrients, disease, or environmental toxins affect the very fabric of our bodies. Other work requires an understanding of health in a social and behavioral context—what it means to families, children, and caregivers, and what can be done to improve it. In many cases we know what should be done, but have a difficult time making it happen. For example, we know that washing hands is one of the best ways to reduce the spread of disease in child care centers, but getting people to do it consistently is very hard.

This means that basic research into disease, nutrition, and health needs to be integrated with educational and psychological research in order to promote healthy development and to prevent problems in health from ever occurring. We know many of the causes of health and safety problems for children today. The challenge is how to create an environment where we put into practice what we know to be effective.

—Don Bailey

Bailey is director of the Frank Porter Graham Child Development Center and holds academic appointments in both the School of Education and the School of Medicine at UNC-Chapel Hill

"Health is not merely the absence of illness, but a positive sense of well-being."

—World Health Organization

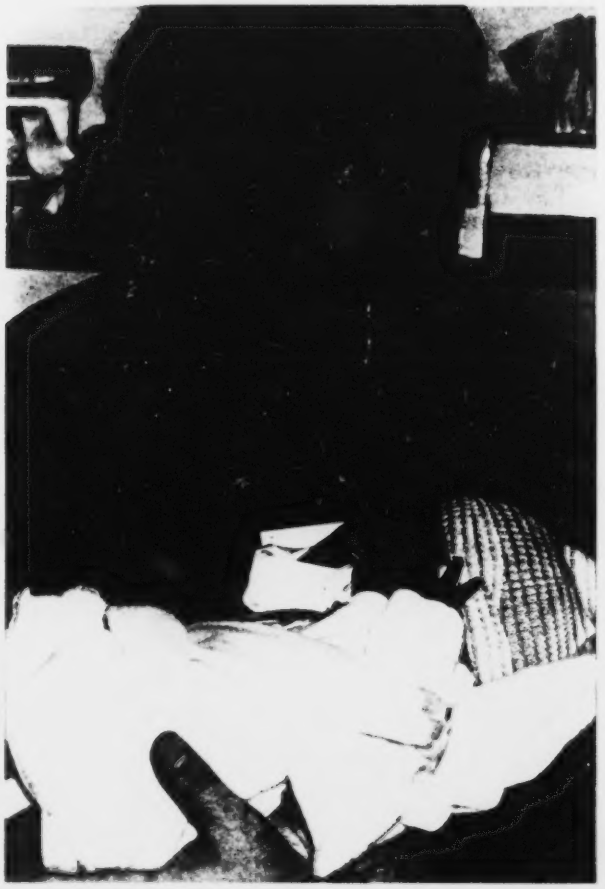
Lullabye and good-night

Study finds links between sleep behaviors and later learning and development

Photos by Jane Barlow

Research into the health of children has been a significant component of the Frank Porter Graham Child Development Center since it was founded 30 years ago.

Hand in hand with the Center's Abecedarian Project of the early 1970s was a continuous study of the health of children attending FPG's child care center. Early researchers began monitoring otitis media and respiratory tract infections and their effect on learning. Data on pulmonary function, lung growth, and vaccine evaluations were collected. FPG also began helping train family nurse practitioners who were attending the University of North Carolina at Chapel Hill.



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IN THE 1980s, FPG INVESTIGATORS studied the effects of second-hand cigarette smoke on children and discovered that children who lived with smokers had more lower-respiratory tract infections and more incidents of otitis media with effusion. Center research showed that viruses, such as colds and flus, can disable a child's natural defense system against earaches and other bacterial infections. During that time, FPG also helped in the opening of a number of educational child care centers around the nation for premature children.

Studying sleep in preterm infants

Work in many of these areas continues today. For example, Diane Holditch-Davis of the UNC-CH School of Nursing and an FPG fellow, has a number of ongoing

projects involving premature infants. One of her recent studies found that preterm infants who were given a one-and-a-half-hour nap four times a day, with their beds covered and undisturbed, gained more weight and showed a more rapid decline in the incidence of apnea than infants receiving standard nursing care. By the end of a three-week period, the experimental infants weighed an average of 1,600 grams versus an average of 1,419 grams for infants in the control group.

Neonatal nurses have long suggested that the stimulation received in the intermediate care unit is inappropriate for the development of convalescent premature infants. In the Holditch-Davis study, infants who were given one-and-a-half-hour naps four times a day slept more than infants who received standard nursing care.

"Thus, a simple modification of nursing care that involved minimum increases in nursing time had an impact not only on the sleeping and waking of preterm infants, but also on the incidence of apnea and rate of weight gain. Since a simple modification of nursing care had relatively large effects, practicing nurses need to carefully evaluate nursing care to determine whether all aspects are needed and effective," wrote the authors of the study published in *Neonatal Network 16*(8), pp. 35–43, last year.

Holditch-Davis' recent work has focused not only on ways to improve nursing care for premature infants, but also on ways to better assess the health of preterm infants. Here are summaries of several projects in which she has been involved:

Sleeping, waking measures

This study compared electroencephalograms (EEG) and behavioral measures

...those who showed more rapid active sleep development had the highest mean IQ and significantly better language, fine motor, and observational play scores [at three years of age] than children in other clusters.

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of sleeping and waking in premature infants to identify differences between these measures that might be indicators of neurological development. Infants selected for the study were at high risk for developmental problems because of birthweight less than 1,500 grams, mechanical breathing or both. The similarities and differences between behavioral and EEG scoring were examined to determine the minute-by-minute agreement.

Results indicate that differences between EEG and behavioral observation do, in fact, reflect the immaturity of the infant's brain. "With additional study, it may be possible to use the developmental patterns of these disagreements to identify infants at risk for neurological problems," Holditch-Davis said.

Sleep-wake behaviors

Can the developmental status of three-year-olds, born prematurely, be predicted from the development of sleep-wake behaviors during the preterm period?

This study of 51 children who were followed for three years found that those who showed more rapid active sleep development had the highest mean IQ and significantly better language, fine motor, and observational play scores than children in other clusters.

Irritability

Many clinicians believe that infants with chronic lung disease show more irritability and react more negatively to care than other preterm infants. This study examined sleep-wake states and behaviors in a group of infants with chronic lung disease and a group without the disease. Infants were also checked when alone and when they were with nurses.

The study found few differences between the groups. Sleep-wake states did not differ. "...there is no evidence that 32- to 36-week preterm infants with chronic lung disease are more irritable or react more negatively to care than other preterm infants," said Holditch-Davis.

Since a simple modification of nursing care had relatively large effects, practicing nurses need to carefully evaluate nursing care to determine whether all aspects are needed and effective

Studies focus on ways to better assess preterm infant health

For further information

- Holditch-Davis, D., & Edwards, L. (In press). Temporal organization of sleep-wake states in preterm infants. *Developmental Psychobiology.*
- Holditch-Davis, D., & Edwards, L. (In press). Modelling development of sleep-wake behaviors: Results of 2 cohorts of preterms. *Physiology and Behavior.*
- Holditch-Davis, D. (1995). Behaviors of preterm infants with and without chronic lung disease when alone and when with nurses. *Neonatal Network, 14*(7), 51–57.
- Torres, C., Holditch-Davis, D., O'Hale, A., & D'Auria, J. (1997). Effect of standardized rest periods on apnea and weight gain of convalescent preterm infants. *Neonatal Network, 16*(8), 35–43.
- Holditch-Davis, D., Barham, L., O'Hale, A., & Tucker, E. (1995). The effect of standardized rest period on convalescent preterm infants. *Journal of Obstetric, Gynecologic and Neonatal Nursing, 24*, 424–432.

Assessing health risks earlier

Ongoing research includes a look at measures of biological risk. Here are summaries of several ongoing research projects at FPG involving infants' health.

Fragile Infants

FPG Fellow Margaret S. Miles is principal investigator of the study "Parental Role Attainment with Medically Fragile Infants." (A medically fragile infant has a serious life-threatening health problem within the first two months as the result of prematurity, a serious birth defect, or severe chronic disease.) The goal of the study is to identify key factors affecting the response of parents, especially those who are high-risk, so that appropriate interventions to support parental role attainment can be developed. Co-principal investigator is Diane Holditch-Davis at UNC-CH's School of Nursing and co-investigators are Peg Burchinal and Barbara Goldman, both at FPG. This study is examining these questions:

- How do parental involvement, identity, and competence with medically fragile infants develop and change over time and across settings, and what are the relationships among parental involvement, identity, and competence?
- How do characteristics of the infant and the infant's illness influence parental involvement?
- How do fathers differ from mothers in parental involvement and what factors influence the development and maintenance of their parental roles?
- What aspects of parental involvement influence the quality of the mother-child relationship at 12 and 15 months?

Taking part in the study are 85 medically fragile infants and their parents, who are being followed until the infants reach 15–18 months.

Risk assessment

The study, "Assessment of Biological and Social Risk in Preterm Infants," is examining four measures of biological risk—sleeping and waking state development, dysmature electroencephalogram (EEG) patterns, neurological insults, and visual attention. Diane Holditch-Davis and her team are examining:

- The effectiveness of these measures in predicting 12- and 24-month health and developmental outcomes
- The relationship between these measures
- The interaction of biological risk measures with measures of social risk in predicting 12- and 24-month developmental and health outcomes
- The identification of predictors of developmental and health outcomes

In this study, 150 high-risk preterm infants from two hospitals are being recruited as soon as their medical conditions are no longer critical. They are being followed for two years past term. "If predictors can be used clinically to identify infants in need of intervention, then early intervention resources could be targeted to those most likely to benefit from them," said Holditch-Davis.

Support Intervention

In another study, "A Nursing Support Intervention with Mothers of Preterm Infants," Holditch-Davis and Miles are examining a support intervention for mothers of high-risk infants after hospital discharge. Four questions are posed:

- Is a supportive intervention for mothers of preterm infants at risk for chronic health problems feasible?
- Will the intervention affect the use of services, maternal psychological well-being, and quality of social environment?
- Six months after term, will these mothers have fewer and less intense unresolved issues from their child's experiences in the neonatal intermediate care unit than mothers without this intervention?
- What specific activities will be performed by the intervention nurses?

Forty subjects have been enrolled in the program, and the intervention is being delivered when the infants have been home for at least two weeks.

For further information

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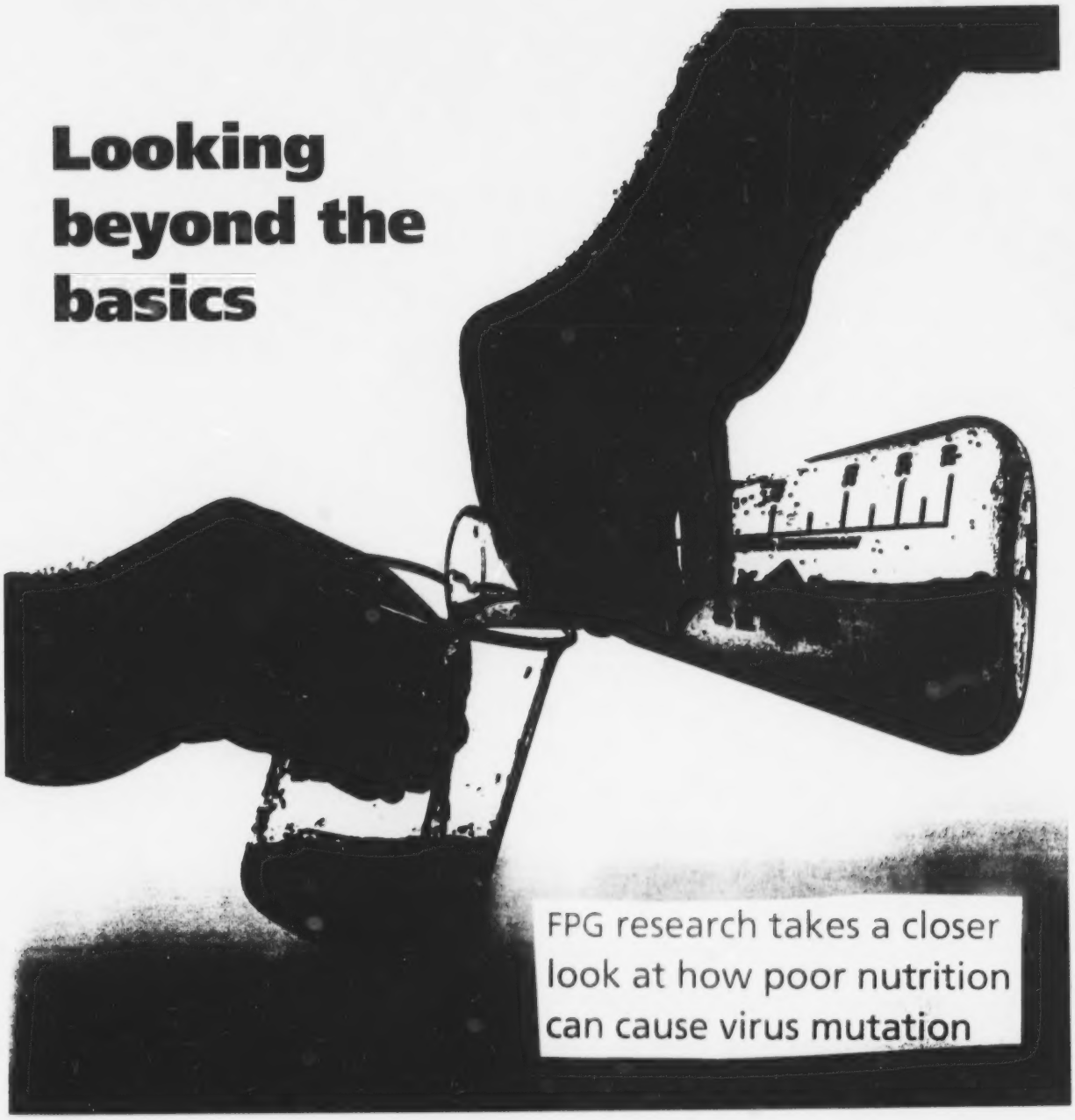
Looking beyond the basics



FPG research takes a closer look at how poor nutrition can cause virus mutation

HAVING MADE THE BREAKTHROUGH THAT LINKED poor nutrition with the mutation of a benign virus into a virulent one, a Frank Porter Graham Center researcher is now taking a closer look at that link to determine exactly how it works.

Earlier work of Melinda Beck established that nutritional deficiencies of either selenium or vitamin E set the stage for the virus, Coxsackievirus B3 (CVB3), to change into a dangerous mutant.

In one new study, Beck and co-principal investigator Jean Handy, also at the University of North Carolina at Chapel Hill, are studying two human diseases strongly associated with a coxsackievirus and a nutritional deficiency. In China, Keshan disease, which affects the heart tissue, has been found in thousands of people with low selenium levels. However, seasonal outbursts of Keshan disease suggest that an infectious disease is required along with a selenium deficiency. And Chinese scientists have isolated CVB4 (one of the dangerous mutant variations) from victims of Keshan disease.

In Cuba, an epidemic of more than 50,000 cases of a nerve disorder occurred in the early 1990s. Among the factors believed to have led to the epidemic were major changes in the Cuban diet that reduced levels of vitamin E and selenium, among other things. Again, a coxsackie-like virus was isolated from the cerebrospinal fluid of 105

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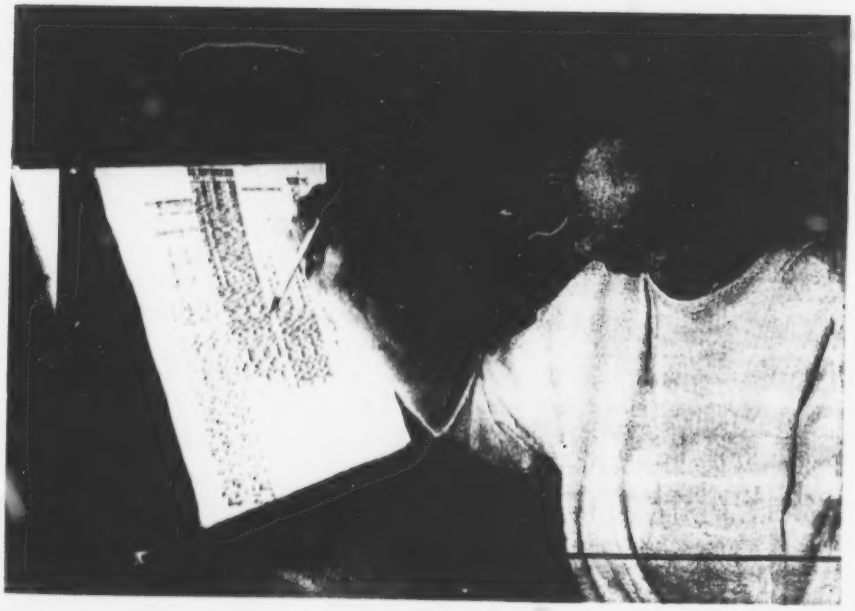
out of 125 patients tested, suggesting a role for this virus in the nerve disorder.

Beck said her study will posit the China and Cuba epidemics as a model for emerging viral diseases caused by a nutritional deficiency, specifically an increase in host oxidative stress. Both selenium and vitamin E act as antioxidants and a deficiency puts stress on the body's immune system. The study will also see if a nutritional deficiency can cause the benign polio virus used in vaccines to mutate into the virulent version.

"Taken as a whole, we believe this study will provide important new information on the critical role of nutrition in emerging infectious diseases, a long neglected area of study," said Beck.



This study is funded by the National Institutes of Health (NIH).

In a second study, also just beginning, Beck is hoping to find out how a deficiency in vitamin E or selenium affects the body's immune functioning. Preliminary data, she said, show that viruses replicate faster in selenium- or vitamin-deficient mice, and it appears that it is the increased rate of replication that increases the chances of a virus mutation.

This increased reproduction may occur because the immune system is impaired, thus allowing viruses to escape normal mechanisms to control them, or the increased replication may be due to stress. Her study will examine this and also the question of whether a common mechanism of oxidative stress leads to identical changes in a virus.

[In any given population of a virus, there is enormous variety in the actual makeup of individual viruses. Thus, a particular virus is really only a statistical consensus of a genetically heterogeneous population that is in constant flux. Some scientists call this "a swarm" or "cloud" of related mutants. It is this constant flux that allows viruses to be widely adaptable to changing environmental conditions.]

> "...we believe this study will provide important new information on the critical role of nutrition in emerging infectious diseases..."

Also, Beck's study will determine if selenium or vitamin E supplements can prevent or reduce CVB3-induced myocarditis.

Consulting with her on this second project are Orville A. Levander, a nutritional chemist at the U.S. Department of Agriculture's Agricultural Research Service, and John F. Sheridan at Ohio State University.

This project is funded by NIH, although past work on CVB3 has been supported by the U.S. Department of Agriculture.

The mystery of the virus

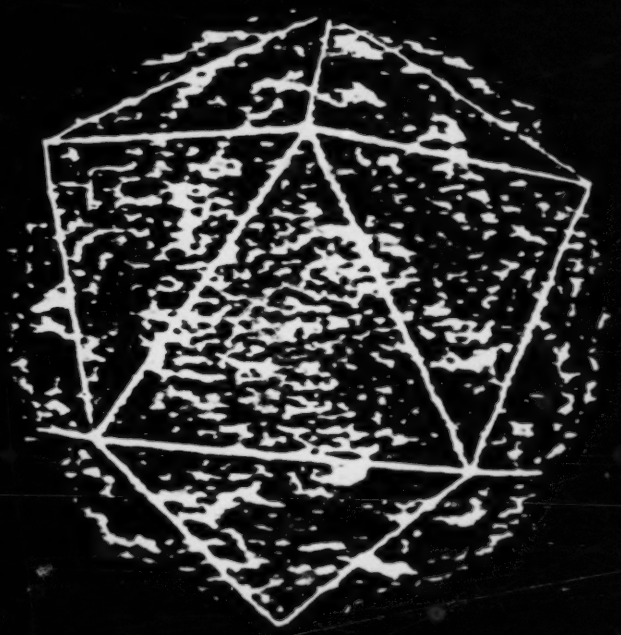
If implications of virus mutations are profound even for well-nourished populations, they are vastly more important for undernourished populations

NUTRITION HAS LONG BEEN KNOWN to affect the body's ability to respond to infectious disease. The traditional explanation of this has been that nutrient deficiencies weaken the immune system. Thus, the host is more susceptible to infections.

However, HPG researcher Melinda Beck has shown that a host deficiency in either selenium or vitamin E can lead to a mutation in the virus, such that a benign strain becomes virulent and a virulent strain becomes more virulent. The mutant virus can even attack healthy bodies. The implications of Beck's findings for even well-nourished populations are profound. For example, the benign form of coxsackievirus infects about 20 million Americans a year.

Orville Levander, who consults with Beck and is a nutritional chemist with the U.S. Department of Agriculture, wrote in an article in the May, 1997 issue of *The Journal of Nutrition* that if the findings with coxsackievirus are applicable to other viruses in the same family, the results could be of "great public health significance" because this family of viruses (known by their composition as ribonucleic acids or RNAs) constitutes the majority of all plant, animal and human viruses. For example, Ebola, Dengue, influenza, measles, hepatitis, polio, the common cold, and HIV are all RNA viruses.

In another article in that same issue of *The Journal of Nutrition*, Beck wrote, "... a single individual with HIV harbors a broad array of viral variants. Perhaps the nutritional status of the patient contributes to the



White lines superimposed on this viral structure highlight the assembly of the virus capsid, which behaves as an assembly of five pentamers. The capsid serves to protect the viral RNA which resides inside this outer shell.

The capsid structure of a typical coxsackievirus

Photo courtesy of Arthur J. Olson, The Scripps Research Institute © 1986

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generation of these mutants. Thus, proper nutrition becomes important not only from the standpoint of the host but also from the standpoint of the pathogen."

In China, Keshan disease, an infection of the heart tissue, has long been associated with selenium deficiencies in people and in the soil. But, because Keshan epidemics have been seasonal, scientists suspected an infectious agent. It wasn't until Beck's work that the nature of the links became recognized.

If other viruses have this same propensity to mutate in selenium-deficient people or animals, it might explain why new influenza strains regularly emerge from China, where selenium-deficient soils are common. Many flu viruses, for example, are thought to originate in ducks, jump to pigs, and then infect people.

One scientist has theorized that Ebola contains genes dependent on selenium. The theory goes that when selenium levels in Ebola-infected cells drop, or are too low to begin with, the virus reproduces and "escapes" in search of cells with more selenium; thus, spreading the infection through the body. Much of the soil in Zaire, where cases of Ebola have been reported, is deficient in selenium. Several scientists are testing selenium in the treatment of AIDS.

The significance of Beck's findings is not limited to nutritionally deprived populations. In theory, it would take only one selenium-deficient person or animal to produce a new family of virus mutants.

Levander suggested a systematic survey of various nutritional deficiencies to determine which were capable of directing the evolution of viruses. It would also seem reasonable, he said, to screen various viruses to see which, aside from coxsackie, are affected by host nutriture.

Beck, in fact, is planning to do exactly that. She says her next series of grant requests will be to see if mutations of the influenza virus can be caused by nutritional deficiencies. She said, "We will try to answer some of the questions around, for example, the 'bird flu' in Hong Kong. However, we need preliminary data before speculating on that."

The Hong Kong cases are the first in which an avian influenza virus apparently has jumped to humans without first going through pigs or other animals. Beck's work may provide clues to solving this mystery.

Malnourished children are already at risk

for developmental delays and are more susceptible to illness and disease

If the implications of research into coxsackievirus by Melinda Beck for even well-nourished adults are profound, the implications for children are extreme.

"The cocksackievirus is a very common childhood virus. Children and immune-compromised individuals are especially susceptible to this virus," said Beck. A mutant and virulent form of the virus abroad in a population could be devastating.

Beck's work on nutrition also dovetails with a new report from UNICEF, which says that over 200 million children under the age of five in developing countries are malnourished. "Malnourished children often suffer the loss of precious mental capacities. They fall ill more often. If they survive, they may grow up with lasting mental or physical disabilities," writes Kofi A. Annan, secretary-general of the United Nations, in the report, "The State of the World's Children 1998."

The report states, "In young children, malnutrition dulls motivation and curiosity and reduces play and exploratory activities. These effects, in turn, impair mental and cognitive development by reducing the amount of interaction children have both with their environment and with those who provide care.

"Of the nearly 12 million children under five who die each year in developing countries mainly from preventable causes, the deaths of over 6 million, or 55 percent, are either directly or indirectly attributable to malnutrition. Malnourished children, unlike their well-nourished peers, not only have lifetime disabilities and weakened immune systems, but they also lack the capacity for learning that their well-nourished peers have.

"Almost half of the economic growth achieved by the United Kingdom and a number of western European countries between 1790 and 1980, for example, has been attributed to better nutrition and improved health and sanitation conditions, social investments made as much as a century earlier."

In the United States, researchers estimate that over 13 million children—more than one in every four under the age of 12—have a difficult time getting all the food they need, a problem that is often at its worst during the last week of the month when families' social benefits or wages run out, according to the UNICEF report.

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Testing, 1... 2... 3...

Hearing research offers strategies for dealing with ear infections

Otitis media is one of the most common illnesses of early childhood and the most frequent diagnosis made by physicians in young children. Direct and indirect healthcare costs for the diagnosis and management of otitis media are estimated at $3.5 billion annually.

Acute otitis media is diagnosed in about 30% of preschool children being evaluated for acute illnesses in the outpatient setting. Otitis media with effusion (OME—fluid in the middle ear) occurs in as much as 40% of children during the first two years of life. Of particular concern to parents and caregivers is that the incidence of otitis media in children is highest between three months and two years of age, according to Dr. Fred Henderson, a pediatrician and an investigator at FPG. Henderson authored a chapter on "Medical Management of Otitis Media" in the book, *Otitis Media in Young Children: Medical, Developmental and Educational Considerations*, published last year.

Otitis media, which has been studied at the Frank Porter Graham Center for more than three decades, may be significant to the development of young children because OME can impair the transmission of sound, causing a mild to moderate conductive hearing loss. (Details on several FPG studies involving otitis media were in *Early Developments*, Vol. 2, No. 1.)

FPG researcher Joanne Roberts, one of the editors of *Otitis Media in Young Children*, said that her own research and a survey of current literature may lend some support to a hypothesized linkage between OME and language development. Here's the hypothesis:

A child with OME may experience a mild to moderate fluctuating hearing loss and thus receive a partial or inconsistent auditory signal. As a consequence, the child may appear distracted and disorganized. The illness associated with OME may diminish the child's interactions with people and objects. Frequent bouts may result in the child having fewer opportunities to establish a knowledge base from which language develops. The child may restrict or change his or her interactions with caregivers.

Prolonged or frequent OME could affect child outcomes in attention, speech-language, and academics. The child could then be at a disadvantage for learning the basics of language. For example, a

Recent publications

By researchers at the Frank Porter Graham Child Development Center

Preserving childhood for children in shelters.
T. Harms, A. Richardson, & P. Rolandelli (Eds.). (1998). Washington: CWLA Press.

Differentiation without separation: Challenging the gifted adolescent in the middle school classroom.
J. Gallagher, & M. Coleman. (1997). In J. Flood, D. Lapp, & K. Wood (Eds.), *Staff development guide for middle school teachers* (pp. 193–199). New York: Macmillan/McGraw Hill.

Blending middle school philosophy and the education of gifted students: Five case studies.
M. Coleman, J. Gallagher, & J. Howard. (1997). Washington: National Association for Gifted Children.

Cooperative learning and gifted students: Reports on five case studies.
M. Coleman, J. Gallagher, & S. Nelson. (1997). Washington: National Association for Gifted Children.

Leadership manual for completing a comprehensive self-assessment of gifted services.
M. Coleman, J. Gallagher, & C. Harradine. (1997). Chapel Hill: Univ. of North Carolina, Frank Porter Graham Child Development Center, Statewide Technical Assistance for Gifted Education.

Programming for gifted learners: Developing a system-level plan for service delivery.
A. Harrison, & M. Coleman. (1997). Chapel Hill: Univ. of North Carolina, Frank Porter Graham Child Development Center, Statewide Technical Assistance for Gifted Education.

hearing loss from OME can make it hard for a child to hear the "-s" in plurals and possessives and to hear short words, such as "is" and "the." These difficulties may in turn later affect academic achievement, particularly in reading and other language-based subjects.

However, Roberts said, there is no consensus in the research community about the precise relationship between speech and language skills and a child's OME history. "Clearly, there continues to be the need for methodologically rigorous studies to examine OME sequelae," she says.

Roberts makes these suggestions in her book to parents, the early care and education workforce, and those in the medical professions for management strategies for dealing with OME:

- It is important to identify when children with OME have a hearing loss, the degree of the loss, and if it involves both ears.
- Hearing screening should occur after children have bilateral OME for three months or after recurrent episodes of OME.
- Some children are at increased risk for OME and for language difficulties and their hearing should be routinely checked, particularly during the winter. These groups include children with Down syndrome, fetal alcohol syndrome, and craniofacial abnormalities.
- The language skills of children with persistent OME should be monitored to see if a child is showing a language delay.
- Families and other caregivers of young children with recurrent or persistent OME need current, understandable, and accurate information in order to make decisions about management.
- Many children with OME and hearing loss do not exhibit obvious symptoms. Increasing caregivers' awareness of the subtleties of signs, along with screenings, may best identify children at risk for language learning difficulties due to OME.
- Children who have hearing loss need listening environments that optimally facilitate language. For example, the saliency of the speech signal should be increased and background noise minimized.
- For a child with ongoing OME or a history of OME who is having hearing or attention difficulties, an open classroom or large group setting with background noise may be particularly difficult.
- Children who frequently experience OME may benefit from a highly responsive language environment, such as interactive games, immediate and consistent responses to the child, checking to make sure the child understands directions and new information, and so forth.
- Increase children's attention to language by singing simple songs with repeated words and phrases, playing word and listening games, rhyming games and so forth.
- Some children with a history of OME may exhibit language difficulties and need to be enrolled in speech-language therapy. Some children may benefit from acoustic amplification.

(*Otitis Media in Young Children: Medical, Developmental, and Educational Considerations* is published by Paul H. Brookes Publishing Co., Baltimore, MD.)

Educating exceptional children. (8th ed.).
S. Kirk, J. Gallagher, & J. Anastasiow. (1997) Boston: Houghton-Mifflin.

Family and professional perspectives on early intervention: An exploration using focus groups.
P. Wesley, V. Buysse, & S. Tyndall. (1997). *Topics in Early Childhood Special Education, 17* (4), 435–456.

Part H updates (2nd ed.).
J. Danaher, & N. Guadagno (Eds.). (1998). Chapel Hill, Univ. of North Carolina, Frank Porter Graham Child Development Center, NECTAS.

Section 619 Profile (8th ed.).
S. deFosset. & M. Carlin (Eds.). (1997). Chapel Hill, Univ. of North Carolina, Frank Porter Graham Child Development Center, NECTAS.

Resources related to children and their families affected by alcohol and other drugs. (3rd ed.).
J. Melner, J. Shackelford, E. Hargrove, & D. Daulton (Eds.). (1997). Chapel Hill, Univ. of North Carolina, Frank Porter Graham Child Development Center, NECTAS.

1996–97 directory of selected early childhood programs.
A. Ramirez (Ed.). (1997). Chapel Hill, Univ. of North Carolina, Frank Porter Graham Child Development Center, NECTAS.

State and jurisdictional eligibility definitions for infants and toddlers with disabilities under IDEA. (Rev. Ed.).
J. Shackelford. (1998). Chapel Hill, Univ. of North Carolina, Frank Porter Graham Child Development Center, NECTAS.

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National studies in the news

Helping children breathe easier

Respiratory infections are still the major health problem in child care settings

The prevention of respiratory infections in child care centers remains a public health challenge, according to a paper delivered during a synthesis conference on "Research Into Practice in Infant/Toddler Care" held in the fall of 1997 by the National Center for Early Development & Learning (NCEDL).

Drs. Albert M. Collier and Frederick W. Henderson, both pediatricians at the University of North Carolina at Chapel Hill, said a survey of current literature reveals "no published data describing a successful intervention to reduce the risk of upper respiratory diseases in day care centers." Both are also FPG fellows.

Research, including work done for more than 30 years at FPG's own child care center, shows that viral respiratory tract infections peak during the second six months of life, between seven months and one year of age. During this period, the level of antibodies is at its lowest in life. That's because of the decreasing level of antibodies passed across the placenta from the child's mother during pregnancy and the fact that it takes the child's immune system about two years to begin producing antibody levels approaching those of a mature child.

Children under the age of three who attend child care have more respiratory infections than children of the same age who are cared for at home. The severity of these infections in young children is also greater. Children who are routinely in contact with only three children daily rather than 30 children have less of a chance of coming into contact with an infectious agent. Children attending child care will be infected with viral respiratory infections earlier than children living at home with no siblings in school.

Respiratory infections account for 75% to 90% of infections in child care settings, according to several large studies. In an FPG study of 206 children followed for 864 child-years, infants less than a year old had an average of nine respiratory illnesses a year of which 46% were associated with otitis media and 13% with lower respiratory manifestations.

Collier and Henderson suggested that one strategy for future research in the control of respiratory tract infections in child care would be to increase the individual child's immunity to the most important respiratory agents. This should be approached first by making sure that the children and child care staff are fully vaccinated on schedule for vaccine-preventable respiratory illness.

Second, research could focus on maternal immunization during pregnancy to optimize the level of antibodies in the mother to a particular respiratory tract pathogen. Passive antibodies would then be at a high level to pass across the placenta to the newborn. As the mother's passive antibodies disappear, the child might then be immunized with new vaccines against common respiratory pathogens.

The researchers predicted that in the near future vaccine development will certainly focus on the respiratory syncytial, parainfluenza, and influenza viruses. "Adenoviruses could also be an important target for prevention," they said.

Curiously enough, they said, a synthesis of research shows no evidence that excluding sick children from a child care center reduces the incidence of acute respiratory disease. Children with viral respiratory infections excrete the infectious virus four to five days before they show signs and symptoms of the infection.

In another study by FPG researchers, a hygienic intervention was conducted at a random selection of child care centers at the same time as another random group of centers received no intervention. The intervention included such things as:

- handwashing of children & staff
- disinfecting the toilet & diapering area
- physical separation of diapering area from food preparation & service areas
- hygienic diaper disposal
- daily washing & disinfecting of toys, sinks, kitchen & bathroom floors
- daily laundering of blankets, sheets, dress-up clothes, other items
- hygienic preparing, serving and clean-up of food.

No significant difference in the rates of illness from respiratory tract infections was found in centers with interventions and those without.

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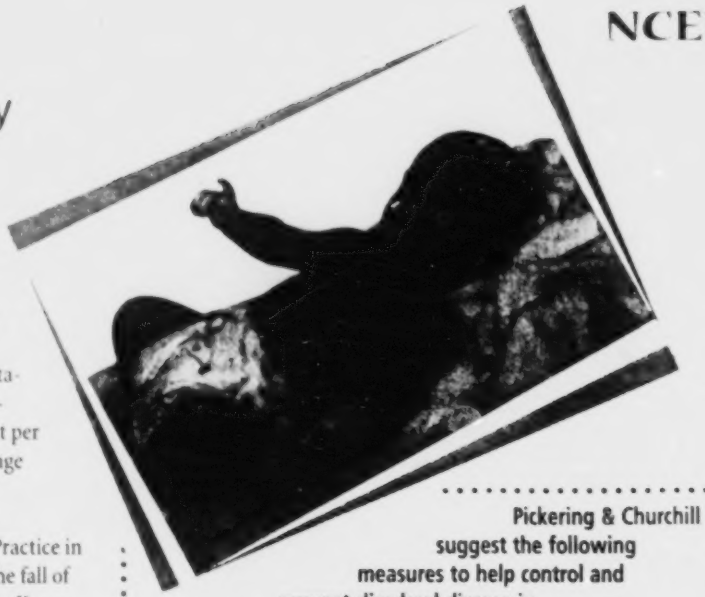
Keeping children healthy outside the home

Researchers cite ways to help control diarrhea in out-of-home child care



The rate of diarrheal disease in children cared for out of the home is two to three times that in children cared for at home, according to a presentation sponsored by the National Center for Early Development & Learning (NCEDL). One study puts the mean cost per episode of diarrhea at $289, while another finds an average cost of $172 per child-year.

These findings were presented during a "Research Into Practice in Infant/Toddler Care" synthesis conference by NCEDL in the fall of 1997 in Chapel Hill, NC. Drs. Robin B. Churchill and Larry K. Pickering presented their data and surveyed current literature for their paper, "Health Issues in the Context of Out-of-Home Child Care: Diarrheal Disease in Infants and Toddlers." Both are pediatricians at UNC-CH.

An increased rate of diarrheal disease has been shown to occur in children newly enrolled in child care centers, and this is likely due to exposure to pathogens not previously found in the home environment, the researchers said.

Studies, including those at FPG, show that fecal contamination in infant and toddler areas of child care environments is common. Dry surfaces, diapering areas and bathroom sinks and faucets were less likely to be contaminated than the hands of children and staff, classroom sinks and faucets, and toys.

Classrooms with high levels of coliform bacteria on the hands of staff also tend to have high levels on the hands of the children, researchers said.

Several studies, including one by FPG researchers, show that training in hygienic practices including handwashing and diapering techniques resulted in a decrease in severe diarrhea in classrooms caring for children under 24 months.

The researchers said that education of child care providers and parents in handwashing and other hygienic practices and strict adherence to these practices remain "the cornerstone of prevention and control of diarrheal disease in the child care setting."

Vaccines against only two gastrointestinal-tract pathogens have been approved by the U.S. Food and Drug Administration (FDA), but neither is considered important in the child care setting. "Vaccines against enteric pathogens, especially viral agents, represent a promising means of control in the future," the researchers said. The FDA is considering an orally administered vaccine for prevention of rotovirus, a virus commonly implicated in outbreaks of diarrhea in child care settings.

Pickering & Churchill suggest the following measures to help control and prevent diarrheal disease in child care environments...

- In child care centers, food preparation areas should be completely separate from diapering and toilet areas.
- Diaper-changing areas should never be used for temporary placement of food.
- There should be an adequate number of sinks adjacent to child-size toilets and diapering areas.
- The use of potty chairs should be discouraged.
- The use of automated faucet-handle-free handwashing sinks should be considered because they may aid in decreasing fecal contamination.
- Surfaces should be designed and built for ease of cleaning. For example, diaper-changing surfaces should be nonporous to allow adequate sanitization between uses.
- Facilities should allow separation of children by age group. Children in diapers especially should be separated from toilet-trained children.
- Written handwashing procedures and sanitation policies should be available to all staff and procedures should be enforced.
- Interventions involving parents and the community can be a valuable adjunct in controlling enteric diseases in child care centers. Education on hygienic practices on a community-wide basis has been shown effective in controlling community outbreaks of shigellosis associated with child care centers.

They also suggested that the management of children with diarrhea and control of diarrheal outbreaks in the child care setting include...

- excluding children with diarrhea from the center
- grouping infected children in a separate area with separate staff
- excluding new admissions temporarily
- offering alternative care arrangements including referral to a sick care center
- closing a center temporarily if all other measures fail.

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Research spotlight

Recent findings at FPG

Early Intervention & Mediating Processes in Cognitive Performance of Children of Low-Income African American Families

Margaret R. Burchinal, Frances A. Campbell, Donna M. Bryant, Barbara H. Wasik, and Craig T. Ramey. *Child Development, 68*(5), pp. 935–954.

This longitudinal study of 161 African American children from low-income families examined multiple influences—including early childhood interventions and characteristics of the child and family—on longitudinal patterns of children's cognitive performance measured between 6 months and 8 years of age. These children were part of the original Abecedarian study at FPG, and this is a new analysis of data already collected.

Results indicate that children with higher IQs over time tended to have had high-quality child care, responsive and stimulating care at home, and mothers with higher IQs. Findings suggested that child care experiences were related to better cognitive development, in part, because children who received more responsive and stimulating child care became more responsive and interested in the people and objects in their world. Maternal IQ had both a direct effect on cognitive development during early childhood and an indirect effect through its influence on the family environment.

Early childhood education in a quality care facility and the quality of the family environment were both related to higher child test scores over time, even after adjusting for maternal IQ.

Results indicated that neither the selected characteristics of the mother nor family environment moderated the child care intervention effects. These results in conjunction with results from other intervention studies suggest that responsive care beginning in infancy and continuing through entry to kindergarten may be necessary to achieve long-term child care effects on cognitive outcomes. These results provide further evidence of the malleability of cognitive performance during early childhood.

In contrast to much previous work, the family environment and the child care intervention both remained substantial predictors in the analysis models even at the last assessment at 8 years of age.

In conjunction with other Abecedarian studies and Carolina Approach to Responsive Education project papers, these results provide clear evidence that intensive, high-quality, child care interventions can change the developmental trajectories of cognitive performance and enhance academic outcomes for African American children from low-income families.

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